

## CLAIMS:

1. A color-mixing lighting system (1) comprising:  
a light-emitting diode (6, 7) emitting first visible light having a first peak wavelength in a first spectral range,  
a fluorescent material (8, 9) converting a portion of the first visible light into  
5 second visible light having a second peak wavelength in a second spectral range,  
the second visible light having a full width at half maximum (FWHM) of at least 50 nm.
2. A color-mixing lighting system as claimed in claim 1, characterized in that the  
10 second visible light is red light, the second peak wavelength being in the range from 590 to 630 nm.
3. A color-mixing lighting system as claimed in claim 2, characterized in that the  
second peak wavelength is in the range from 600 to 615 nm.  
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4. A color-mixing lighting system as claimed in claim 1 or 2, characterized in  
that the first visible light-emitting diode (6) emits blue light, the first peak wavelength being  
in the range from 445 to 470 nm and the full-width at half maximum (FWHM) being in the  
range from 15 to 30 nm.  
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5. A color-mixing lighting system as claimed in claim 1 or 2, characterized in  
that the lighting system comprises a further light-emitting diode (7) for emitting third visible  
light having a third peak wavelength in a third spectral range.
- 25 6. A color-mixing lighting system as claimed in claim 4, characterized in that the  
further light-emitting diode (7) emits green light, the third peak wavelength being in the  
range from 510 to 550 nm and the full width at half maximum (FWHM) being in the range  
from 25 to 45 nm.

7. A color-mixing lighting system as claimed in claim 1 or 2, characterized in that the fluorescent material (8) converts blue light into red light, the fluorescent material being selected from the group formed by  $\text{SrS:Eu}$ ,  $\text{Sr}_2\text{Si}_5\text{N}_8\text{:Eu}$ ,  $\text{CaS:Eu}$ ,  $\text{Ca}_2\text{Si}_5\text{N}_8\text{:Eu}$ ,  $(\text{Sr}_{1-x}\text{Ca}_x)\text{S:Eu}$  and  $(\text{Sr}_{1-x}\text{Ca}_x)_2\text{Si}_5\text{N}_8\text{:Eu}$  and ( $x = 0.0-1.0$ ).
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8. A color-mixing lighting system as claimed in claim 1 or 2, characterized in that the lighting system comprises a further fluorescent material (9) converting a portion of the first visible light into third visible light having a third peak wavelength in a third spectral range with the third peak wavelength in the range from 510 to 550 nm and a FWHM of at
- 10 least 40 nm.
9. A color-mixing lighting system as claimed in claim 7, characterized in that the further fluorescent material (9) converts blue light into green light, the fluorescent material being selected from the group formed by  $(\text{Ba}_{1-x}\text{Sr}_x)_2\text{SiO}_4\text{:Eu}$  ( $x = 0-1$ , preferably  $x = 0.5$ ),
- 15  $\text{SrGa}_2\text{S}_4\text{:Eu}$ ,  $\text{Lu}_3\text{Al}_5\text{O}_{12}\text{:Ce}$  and  $\text{SrSi}_2\text{N}_2\text{O}_2\text{:Eu}$ .